UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 90608

MINNETONKA BOULEVARD

OVER

ST. ALBAN'S BAY

DISTRICT 5 - HENNEPIN COUNTY, CITY OF EXCELSIOR

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 3512 (CEI 113)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 90608, Piers 1 and 2, were found to be in good to satisfactory condition below water with no defects of structural significance observed. There were several areas of section loss with exposed reinforcing steel above the waterline, one of which extended to 1 foot below the waterline. Minor vertical and horizontal cracks were observed at random locations above the waterline on both piers. The channel bottom appeared stable with no evidence of significant scour or appreciable changes since the previous inspection.

INSPECTION FINDINGS:

(A) There were several areas of section loss above the waterline with exposed reinforcing steel on both piers with penetrations of up to 5 inches depth. Pier 1 exhibited an area of section loss at the east end of the pier with exposed reinforcing steel that extended to 1 foot below the waterline.

(B) Several horizontal cracks were observed on both piers near the waterline. The cracks extended up to 7 feet along the pier shafts and were up to 1/16 inch wide.

(C) Near the center of each pier a vertical crack was observed extending on both faces of the pier from the cap to the channel bottom with a maximum width of 1/8 inch. There were also some minor areas of section loss and an impending spall at the pier cap related to the cracks.

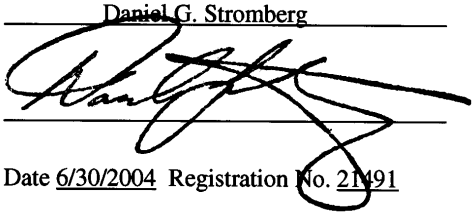
RECOMMENDATIONS:

(A) To inhibit further, more detrimental deterioration, repair the areas of section loss by removing all unsound concrete, cleaning the reinforcing steel, and patching with a concrete mix designed to promote high durability and low permeability.

(B) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

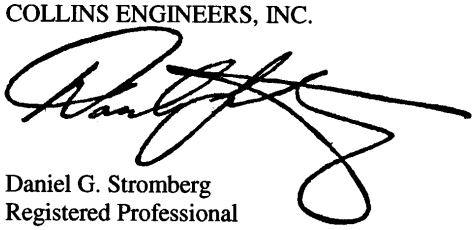
Daniel G. Stromberg



Date 6/30/2004 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.



Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 90608

Feature Crossed: St. Alban's Bay

Feature Carried: Minnetonka Boulevard

Location: District 5 - Hennepin County, City of Excelsior

Bridge Description: The bridge superstructure consists of three concrete deck girder spans supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments and two reinforced concrete piers. The north pier is designated Pier 2 and the south pier is Pier 1. The abutment and pier footings are supported on timber piles.

2. INSPECTION DATA

Professional Engineer/Team Leader: Shirley M. Walker, P.E.

Dive Team: Clayton G. Brookins, Michelle D. Koerbel

Date: September 30, 2002

Weather Conditions: Partly Cloudy, "70E F

Underwater Visibility: "5 Feet

Waterway Velocity: Negligible/None

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2.

General Shape: The piers consist of oblong rectangular shafts squared off at the ends, and they rest on rectangular footings that are founded on timber piles.

Maximum Water Depth at Substructure Inspected: Approximately 7.1 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the step in the pier shaft at Pier 2.

Water Surface: The waterline was approximately 11.2 feet below reference.
Waterline Elevation = 930.6.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 6

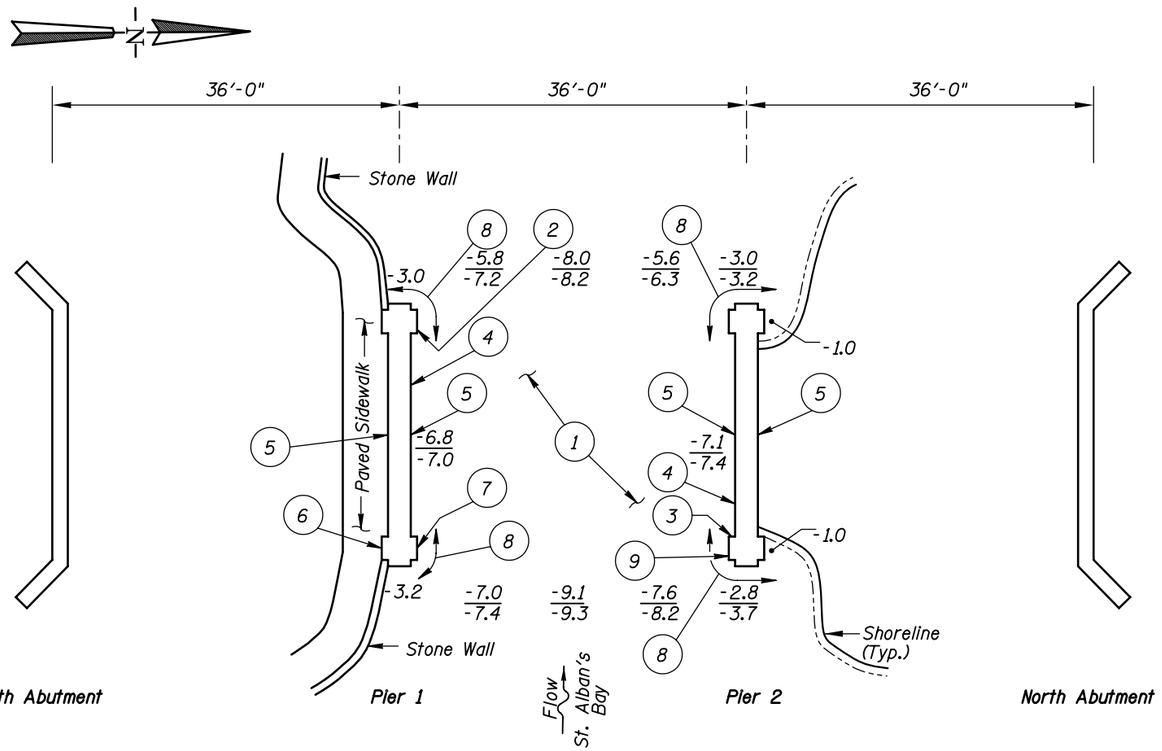
Item 61: Channel and Channel Protection: Code 7

Item 92B: Underwater Inspection: Code B/09/02

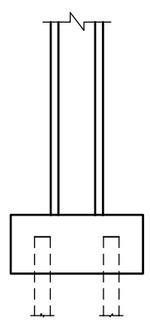
Item 113: Scour Critical Bridges: Code I/91

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

_____ Yes __X__ No



SOUNDING PLAN



TYPICAL END VIEW OF PIERS

GENERAL NOTES:

1. Piers 1 and 2 were inspected underwater.
2. At the time of inspection on September 30, 2002, the waterline was located approximately 11.2 feet below the top of the step in the pier shaft at Pier 2. This corresponds with a waterline elevation of 930.6 based on the previous report dated September 22, 1997.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

(1) The channel bottom material consisted of firm silty sand with up to 4 inches probe rod penetration.

(2) An area of section loss was observed on the northwest corner of the west end of Pier 1 and was located 1 foot below the waterline measuring 6 inches high by 18 inches wide with 1 inch maximum penetration.

(3) An area of section loss with exposed reinforcing steel was observed 1 foot above the waterline measuring 4 inches in diameter with a penetration of 1 inch.

(4) Horizontal cracks were observed near the waterline. The cracks were typically 7 feet long with 1/16 inch maximum width.

(5) A vertical crack was observed near the center of the pier and extended from pier cap to the channel bottom with 1/8 inch maximum width.

(6) An area of section loss with exposed reinforcing steel was observed at the east end of Pier 1 and extended from the top of the pier cap to 4 feet above the waterline measuring up to 3 feet in width with penetrations up to 3 inches deep.

(7) An area of section loss with exposed reinforcing steel was observed at the east end of Pier 1 from the top of the pier cap to 1 foot below the waterline measuring 6 to 18 inches wide with penetrations up to 5 inches deep.

(8) Channel bottom consisted of scattered 1 to 3 foot diameter riprap with scattered 6 inch cobbles.

(9) An area of section loss with exposed reinforcing steel was observed at the southwest corner at the west end of Pier 2 and was located 1 foot above the waterline measuring 1 foot in diameter with a penetration of 1.25 inches.

Legend

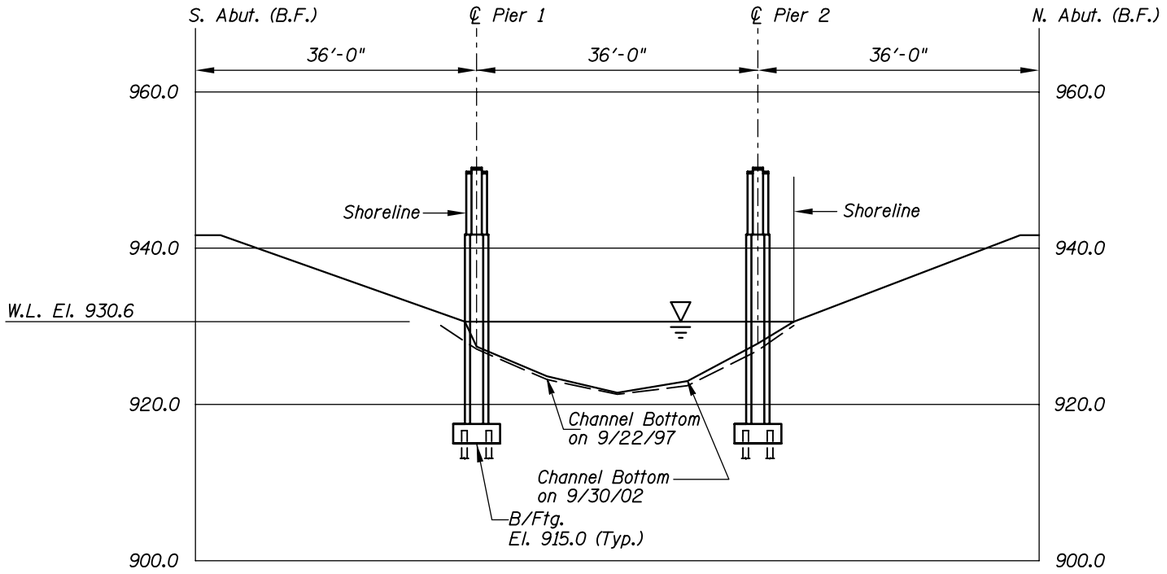
-2.0	Sounding Depth from Waterline (9/30/02)
-5.2	Sounding Depth from Waterline (9/22/97)

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

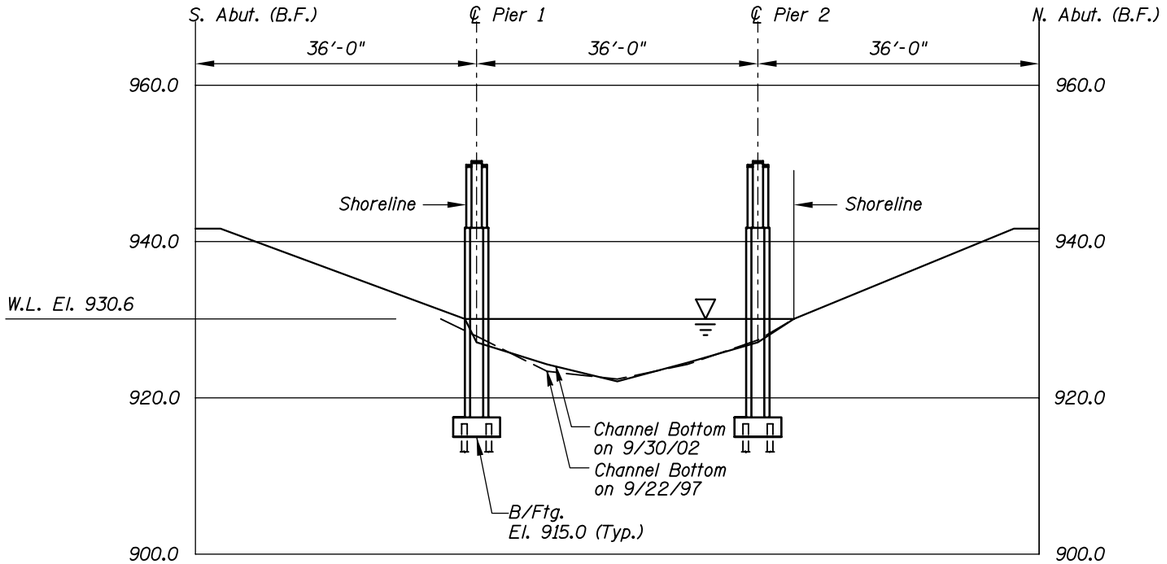
STRUCTURE NO. 90608
OVER THE ST. ALBAN'S BAY
DISTRICT 5, HENNEPIN COUNTY, CITY OF EXCELSIOR

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: SEPT. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: NTS
Code: 35120113		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

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UNDERWATER BRIDGE INSPECTION

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OVER THE ST. ALBAN'S BAY
DISTRICT 5, HENNEPIN COUNTY, CITY OF EXCELSIOR

UPSTREAM AND DOWNSTREAM FASCIA PROFILES

Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: SEPT. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: 1"=20'
Code: 35120113		Figure No.: 2

Photograph 1. Overall View of Structure, Looking Northeast.

Photograph 2. View of Pier 1, Looking Northeast.

Photograph 3. View of Pier 2, Looking Northeast.


Photograph 4. View of spall with exposed reinforcement at east end of Pier 1.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: September 30, 2002
ON-SITE TEAM LEADER: Shirley M. Walker, P.E.
BRIDGE NO: 90608 WEATHER: Partly Cloudy, " 70E F
WATERWAY CROSSED: St. Alban's Bay
DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR
OTHER
PERSONNEL: Clayton G. Brookins, Michelle D. Koerbel
EQUIPMENT: Scuba, U/W Light, Scraper, Lead Line, Sounding Pole, Probe Rod, Camera
TIME IN WATER: 10:40 a.m.
TIME OUT OF WATER: 11:00 a.m.
WATERWAY DATA: VELOCITY Negligible/None
VISIBILITY " 5 feet
DEPTH 7.1 feet maximum at Pier 2
ELEMENTS INSPECTED: Piers 1 and 2
REMARKS: Overall, both piers were in good to satisfactory condition with no defects of structural significance below water. Several areas of section loss with exposed reinforcing steel were observed above the waterline, one of which that extended 1 foot below the waterline at the east end of Pier 2. Minor vertical and horizontal cracks were observed on both faces of both piers at random locations above the waterline. The channel bottom appeared stable with no significant scour or appreciable changes since the previous inspection.

FURTHER ACTION NEEDED: ___X___ YES _____ NO

Repair the areas of section loss by removing all unsound concrete, cleaning the reinforcing steel, and patching with a concrete mix designed to promote high durability and low permeability.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 90608
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Shirley M. Walker, P.E.
WATERWAY CROSSED St. Alban's Bay

INSPECTION DATE September 30, 2002

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.		MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
	UNIT DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 1	6.8'	N	6	N	9	N	6	8	8	8	N	8	6	N	N	6	N	N
	Pier 2	7.1'	N	6	N	9	N	6	8	8	7	N	7	6	N	N	6	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, both piers were in good to satisfactory condition with no defects of structural significance below water. Several areas of section loss with exposed reinforcing steel were observed above the waterline, one of which that extended 1 foot below the waterline at the east end of Pier 2. Minor vertical and horizontal cracks were observed on both faces of both piers at random locations above the waterline. The channel bottom appeared stable with no significant scour or appreciable changes since the previous inspection.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.